

## **REMARKS**

Claims 1-12 and 14-21 remain pending in the application. Claims 1, 3-6, 8-12, 14, 15 and 17-21 stand rejected under 35 U.S.C. 102(e) as allegedly anticipated by Kunikiyo (US 6,717,267). Claims 7 and 16 are rejected 35 U.S.C. 103(a) as allegedly unpatentable over Kunikiyo (US 6,717,267). Claim 2 is rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Kunikiyo (US 6,717,267) in view of Khan et al (US 6,853,070).

In response, Applicant has amended independent claim 1 (the only independent claim) to more clearly define a novel and non-obvious aspect of the claimed embodiments. The basis of the amended claim can be found throughout the specification, drawings and claims of the original application. In this regard, the amendment of claim 1 is supported by the specification, for example, at page 6, the second and third paragraphs from the top of the page and Figs. 5 and 6. Therefore, this amendment adds no new matter to this application. This amendment renders the rejections moot. Notwithstanding, and to advance the prosecution of this application, Applicant sets out the following additional distinguishing remarks.

### **Claim Rejections-35 U.S.C §102**

Turning now to the substantive rejections, claims 1, 3-6, 8-12, 14, 15 and 17-21 stand rejected under 35 U.S.C. 102(e) as allegedly anticipated by Kunikiyo (US 6,717,267). These rejections are respectfully traversed. To anticipate a claim, a reference must teach every element of the claim. In this regard, the Federal Circuit has held: "A claim is anticipated only if each and every element as set forth in the claim is

found, either expressly or inherently described, in a single prior art reference.”

*Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “The identical invention must be shown in as complete detail as is contained in the claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Applicant respectfully submits that Kunikiyo ('267) does not disclose, suggest or teach, *inter alia*, the following features recited by amended claim 1:

1. A semiconductor configuration for dissipating heat away from a semiconductor device having a plurality of power lines, the configuration comprising:

a semiconductor substrate;

an insulating layer disposed on the semiconductor substrate;

**a power line with a plurality of openings** disposed on the insulating layer; and

**a plurality of interconnect structures with at least one pair of vertical portions** disposed in the insulating layer **and a horizontal portion** disposed within the plurality of openings and above the insulating layer, each of the vertical portion having a first end in contact with the semiconductor substrate and a second end disposed substantially level with the power line and extending through the semiconductor device, wherein the interconnect structures for dissipating heat through the substrate,

and further wherein the **horizontal portion of the plurality of interconnect structures are substantially enveloped by a dielectric layer in the openings of the power line.**”

(*Emphasis added*). Claim 1 patently defines over the cited art for at least the reason that the cited art fails to disclose at least the features emphasized above.

Applicant respectfully submits that Kunikiyo does not teach or suggest **a power line with a plurality of openings** disposed on the insulating layer. In addition, the **interconnect structures defined in claim 1 comprise at least one pair of vertical portions** disposed in the insulating layer **and a horizontal portion** disposed within the

plurality of openings and above the insulating layer. Moreover, Kunikiyo fails to teach or suggest that the ***horizontal portion of the plurality of interconnect structures are substantially enveloped by a dielectric layer in the openings of the power line.***

For at least these reasons, independent claim 1 is not anticipated by Kunikiyo.

### **Claim Rejections-35 U.S.C §103**

#### **Dependent claims 2, 7 and 16**

The Office Action rejected claims 7 and 16 as allegedly unpatentable over Kunikiyo (US 6,717,267), and rejected claim 2 as allegedly unpatentable over Kunikiyo (US 6,717,267) in view of Khan et al (US 6,853,070). These rejections are respectfully traversed.

In order for a claim to be properly rejected under 35 U.S.C. §103, the teachings of the prior art reference must suggest all features of the claimed invention to one of ordinary skill in the art. See, e.g., *In re Dow Chemical*, 837 F.2d 469, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988); *In re Keller*, 642 F.2d 413, 208 U.S.P.Q. 871, 881 (C.C.P.A. 1981).

Applicant respectfully submits that all the cited references, singly or in combination, fail to disclose, suggest or teach at least the features of: a plurality of interconnect structures with at least one pair of vertical portions disposed in the insulating layer and a horizontal portion disposed within the plurality of openings and above the insulating layer, wherein the horizontal portion of the plurality of interconnect structures are substantially enveloped by a dielectric layer in the openings of the power line. For at least these additional reasons, dependent claims 2, 7, and 16 patently define over the combination of Kunikiyo in view of Khan et al.

For at least these reasons, independent claim 1 patently defines over the cited art. As claims 2-12 and 14-21 depend (either directly or indirectly) from claim 1, claims 2-12 and 14-21 are patentable by virtue of their dependency from patentable independent claim 1.

### **CONCLUSION**

In light of the foregoing amendments and for at least the reasons set forth above, Applicants respectfully submit that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the pending claims are in condition for allowance.

Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

No fee is believed to be due in connection with this submission. If, however, any fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

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